

Remarks

Amendments to claims

Claims 7-10 are cancelled as drawn to a non-elected species of the invention. Applicants, of course, reserve the right to file a divisional application containing claims to the non-elected species.

The remaining claims 1-6 and 11-20 are each objected to because of informalities in referring to “one or more deformable members.” Each of these claims has been amended to correct these informalities. The Examiner is respectfully requested to reconsider his objections to claims 1-6 and 11-20.

Independent claims 1 and 11 have been amended to more clearly state the invention. These claims now recite that the one or more deformable members are selectively heatable before an impact or at the onset of an impact on the device, and that the heating is to tune the energy absorption capacity of the device without changing the shape of the one or more deformable members. Paragraphs 0009, 0027, 0028, and 0032 of the specification describe selective and individual heating of the deformable members when, for example, radar or accelerometer crash detection systems indicate an impending or beginning crash situation. As taught in the specification, during tuning of the deformable members, their shape is not changed, just their ability to absorb energy.

Independent claims 11 and 14 have been amended to delete the phrase, “under an impact of predetermined magnitude.” This phrase had referred to the possibility of healing one or more of the deformable members after a relatively low impact. But the impact under which a deformable member may be reshaped and healed by heating is not necessarily the same impact that may require tuning of the deformable member. Accordingly, the phrase has been deleted to avoid uncertainty in the claim recitation.

Allowable Subject Matter

Claims 3, 6, 14-16, 18, and 20 have been indicated as allowable if amended to overcome the Examiner's objections as set forth in section 2 of this final action. It is believed that claims 14-16, 18 and 20 are now allowable. It is recognized that dependent claims 3 and 6

still refer to rejected independent claim 1. However, it is urged that independent claim 1, as currently amended, is allowable for the reasons set forth below in this response.


Claim Rejections

Claims 1, 4-5, 11-13, 17 and 19 are rejected under 35 U.S.C. §102(e) as being anticipated by Browne et al, U.S. Patent 6,910,714. The basis for the rejections is that Browne et al disclose shape memory material (such as springs 14) that are all heated in response to an activation signal so that they all expand from their compressed shape in Figure 1A to their expanded shape in Figure 1B. The Examiner observes that, depending on the shape memory material, the two configurations may inherently include different strength levels. The Examiner is respectfully requested to reconsider the rejection of these claims for the following reasons.

The impact energy absorption devices recited in independent claims 1 and 11 comprise one or more deformable members of shape memory material having a first strength level at an operating temperature of the device and second strength level at a higher temperature. Each of the one or more deformable members is selectively heatable so as to tune (change) the energy absorption capacity of the device without changing the shape of the deformable members. The Browne et al patent disclosure heats all deformable members to change the shape of the whole device in anticipation of an impact. But claims 1 and 11 (and the claims that depend from them) each defines a device that can be tuned by selective heating, before or during the onset of an impact, without changing the shape of the deformable members. Applicants' devices, illustrated in Figures 2 and 3 and related text of this application, are tuned for absorption of an anticipated impact but the device is not moved or re-shaped. Just the strength of one or more deformable members of the devices is selectively altered. The Browne et al disclosure does not anticipate the invention recited in the rejected claims.

Accordingly the rejection of claims 1, 4-5, 11-13, 17 and 19 should be reconsidered and removed. It is respectfully requested that claims 1-6 and 11-20 be allowed and the case passed to issue.

Respectfully Submitted,



George A. Grove, Reg. No. 23023
Reising, Ethington, Barnes, Kisselle, P.C.
P.O. Box 4390
Troy, Michigan 48099-4390
248-689-3500

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Julia D. Snell
Assistant to George A. Grove